THE INFLUENCE OF THE SECOND INEQUALITY OF STRONG WOLFE TO THE PERFORMANCE OF CONJUGATE GRADIENT

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ABSTRACT

The conjugate gradient (CG) methods are an iterative method that has been widely used to solve unconstrained optimization (UO) problems. The research will be focused on some variants of RMIL CG under unconstrained optimization problem. RMIL method is one of the CG methods that satisfies an upper bound and has adequate descent and global convergent properties. However, there are a still a lack in this RMIL method. This method is not ideal to solve the problem in terms of numerical performance and its efficiency. The second inequality of strong Wolfe line search will be combined with RMIL and its variants to analyse whether the second inequality of strong Wolfe will affect the performance of the RMIL and its variants. Thus, a comparative study is needed to compare the performance of the variants of RMIL modified with the second inequality of strong Wolfe. Extension to this study, numerical performance of RMIL and its variants will be better as well as convergence properties. The performances of each method were tested with a total of 21 UO test problems. The efficiency of each method will be compared in terms of number of iterations, and CPU times. The findings show that the modified MMSIS method is the most efficient and outperform other methods with the minimum NOI and CPU time.

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